

Preliminary Amendment of U.S. National Stage for International Application  
PCT/US00/24930 filed September 12, 2000

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on a metallic surface of said metal substrate, and a phosphate conversion coating formed on a metallic surface of said metal substrate, said layer of said liquid composition having a non-volatiles content that is from 0.05 to 0.5 g/m<sup>2</sup>; and

- (II) drying said layer of liquid composition, without removing any of said liquid by any other method than volatilization, to form a dry coating.
12. (New) The process of claim 11 wherein said metal substrate reaches a peak temperature during step 11 of from 50 to 250°C.

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REMARKS

The specification has been amended to include a claim to priority of earlier-filed International and Japanese applications.

The specification has also been amended to correct certain inadvertent typographical errors which appear in the paragraphs beginning at line 11 on page 2 and at line 32 on page 4 and the paragraph beginning at line 22 on page 4. Support for the former amendments may be found on page 2, line 25, of the specification as well as in Claim 1 and in the Abstract of the Disclosure. Support for the latter amendment is found in the paragraph as originally filed, wherein it is clear that the phrase "50, 40, 38 or 36 percent by weight" was intended by the Applicants to refer to the preferred maximum levels of the non-volatiles content of component (b) which are present in the aqueous treatment agent composition and not the preferred minimum levels.

Respectfully submitted,



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Version Marked to Show Changes Made

IN THE SPECIFICATION:

The paragraph beginning at line 11 on page 2 has been amended as follows:

It has been discovered that a coating film possessing not only corrosion resistance but also superior adhesion can be formed by treating the surface of a metal material with an aqueous treatment agent that contains a specified resin, a silane coupling agent and fine particles with a particle size of 1.0 [millimeter] micrometer (hereinafter usually abbreviated as ["mm"] "μm") or smaller. This discovery led to the present invention.

The paragraph beginning at line 22 on page 4 has been amended as follows:

The non-volatiles content of component (b) preferably is at least, with increasing preference in the order given, 15, 18, 20, 22, or 24 percent by weight and independently preferably is [at least] not greater than, with increasing preference in the order given, 50, 40, 38, or 36 percent by weight of the total non-volatiles content. If the non-volatiles content of component (b) is less than 20 percent by weight relative to 100 percent by weight of the total non-volatiles content, the adhesion of the coating film drops, as is undesirable. On the other hand, if the non-volatiles content of component (b) exceeds 60 percent by weight, the relative proportion of component (a) in the coating film drops, so that the corrosion resistance drops, as is also undesirable. Good practical results are facilitated by a concentration within the more preferred ranges.

The paragraph beginning at line 32 on page 4 has been amended as follows:

Component (c) is selected from the group consisting of plastic pigments, phosphorus-containing anti-rust pigments, and colloidal-sized silica (including fumed silica), alumina, zirconia, and titania. It is more preferable if any silica, alumina, zirconia, or titania used for component (c) has in fact been prepared as stable colloid dispersed in a fluid continuous phase. If the mean particle size of component (c)

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exceeds 1.0 [mm]  $\mu\text{m}$ , some of the particles are likely to protrude from the surface of the coating film; as a result, moisture may easily invade the surface of the material from the particle interfaces, thus causing a drop in corrosion resistance and adhesion. Accordingly, such a large mean particle size is undesirable.

IN THE CLAIMS

Claims 1, 2 and 9 have been amended as follows:

1. (Amended) An aqueous liquid composition of matter suitable for treating a metal substrate[ either directly or after formation of a chemical plating layer or a phosphate conversion coating layer over said metal substrate, to form over the substrate a corrosion protective layer with excellent adhesion to subsequent paint coatings, said aqueous liquid composition] comprising water and the following components:
  - (a) from 20 to 70 percent by weight of non-volatile constituents of a component selected from a group consisting of urethane resins, epoxy resins, and acrylic resins;
  - (b) from 10 to 60 percent by weight of non-volatile constituents of a component of silane coupling agent; and
  - (c) from 10 to 40 percent by weight of a component of dispersed solid non-volatile particles with a mean particle size of 1.0  $\mu\text{m}$  or less,all of the percentage values specified above for components (a), (b), and (c) being percentages of only the non-volatiles content of said aqueous liquid composition.
2. (Amended) A liquid composition according to claim 1, wherein component (c) is selected from the group consisting of plastic pigments, phosphorus-containing anti-rust pigments, and colloidal-sized silica [(including fumed silica)], alumina, zirconia, and titania.
9. (Amended) An article of manufacture comprising a coated metal surface formed by a process according to [any one of claims] claim 5 [through 8].